

## What is Claimed:

- 1                   1.     An electric motor comprising:
  - 2                   a first housing having:
    - 3                   i)     a first wall defining a first interior space, and
    - 4                   ii)    at least one opening disposed on a surface of the first
    - 5                   housing;
  - 6                   a second housing having:
    - 7                   i)     a second wall defining a second interior space, and
    - 8                   ii)    at least one opening disposed on a surface of the second
    - 9                   housing; and
- 10                  a stator having a plurality of laminations, a first portion of windings and a
- 11                  second portion of windings, the plurality of laminations disposed substantially within at
- 12                  least one of the first interior space and the second interior space,
- 13                  wherein air flows i) into the at least one opening in the first housing, ii)
- 14                  over the first portion of windings, substantially all of an exterior portion of the plurality
- 15                  of stator laminations, and the second portion of windings, and iii) out the at least one
- 16                  opening in the second housing.
- 1                   2.     An electric motor according to claim 1 further comprising, a motor
- 2                   cover substantially enclosing the first and second housings therein, the motor cover
- 3                   including:
  - 4                   i)     a first cover coupled to the second housing, the first cover having at
  - 5                   least one opening in a surface thereof, the at least one opening adjacent
  - 6                   and in fluid communication with the at least one opening in the second
  - 7                   housing, and
  - 8                   ii)    a second cover coupled to the first cover and substantially
  - 9                   surrounding the first and second housings, the second cover having at

10                   least one opening in a surface thereof, the at least one opening adjacent  
11                   and in fluid communication with the at least one opening in the first  
12                   housing.

1                   3.     An electric motor according to claim 2, wherein the first and  
2                   second covers are formed from at least one of a metal and a polymer.

1                   4.     An electric motor according to claim 2, wherein the second cover is  
2                   coupled to a portion of the first housing.

1                   5.     An electric motor according to claim 2, further comprising means  
2                   for sealing the first cover to the second cover.

1                   6.     An electric motor according to claim 1, wherein the first and  
2                   second housings are formed from a metal.

1                   7.     An electric motor according to claim 1, wherein the stator is one of  
2                   substantially square and substantially round.

1                   8.     An electric motor according to claim 1, wherein an end portion of  
2                   the stator is coupled to at least one of the first and second housings.

1                   9.     An electric motor according to claim 1, wherein the at least one  
2                   opening in the first housing and the at least one opening in the second housing are in  
3                   respective planes that are substantially parallel to one another.

1                   10.    An electric motor according to claim 1, wherein the motor is a  
2                   permanent split capacitor motor.

1                   11.    An electric motor according to claim 1, wherein the motor is a  
2                   shaded pole motor.

1                   12.    An oscillating fan incorporating the electric motor according to  
2                   claim 1.

1                   13.    An electric motor comprising:  
2                   a first housing having:

3 i) a first wall defining a first interior space, and

4 ii) a first plurality of openings disposed on a surface of the first  
5 housing;

6 a second housing having:

7 i) a second wall defining a second interior space, and

8 ii) a second plurality of openings disposed on a surface of the  
9 second housing;

10 a stator having a plurality of laminations, a first portion of windings and a  
11 second portion of windings, the stator disposed within at least one of the first interior  
12 space and the second interior space,

13 wherein air flows i) into at least a portion of the first plurality of openings,  
14 ii) over the first portion of windings, an exterior portion of the stator laminations, and  
15 the second portion of windings, and iii) out at least a portion of the second plurality of  
16 openings.

1 14. An electric motor according to claim 13, wherein the motor is a  
2 permanent split capacitor motor.

1 15. An electric motor according to claim 13, wherein the stator is one  
2 of substantially square and substantially round.

1 16. An electric motor comprising:  
2 rotor means;  
3 stator means for providing an electro-magnetic force to the rotor means;  
4 housing means for housing therein at least a substantial portion of the  
5 stator means; and

6 ventilation means for providing airflow i) into the housing means, ii) over  
7 at least substantially all of an exterior portion the stator means, and iii) out of the  
8 housing means.

1 17. An electric motor according to claim 16 further comprising:  
2 cover means for covering the housing means; and  
3 sealing means for forming a seal in the cover means,  
4 wherein the airflow passes into a first portion of the cover means, through  
5 the housing means and out a second portion of the cover means.

1 18. An electric motor according to claim 16, wherein the motor is a  
2 permanent split capacitor motor.

1 19. An electric motor assembly having a rear cover, a front cover  
2 attached to the rear cover, front and rear motor housings inside the front and rear covers  
3 and secured together in fluid tight relation, a motor stator substantially contained within  
4 the front and rear housings, a rotor in the motor stator and having an output shaft with a  
5 fan blade assembly thereon which draws air through the motor assembly, the  
6 improvement which comprises:

7 the rear cover having at least one opening for air to flow therethrough,  
8 the rear housing having at least one opening therein for air to flow  
9 thereinto,

10 the front housing having at least one opening therein for air to flow  
11 thereout, the front and the rear housing secured together,

12 the motor stator is in close contact with the motor housings, such that air  
13 flowing therethrough is in direct contact with substantially all of an exterior portion of  
14 the stator,

15 the front cover having at least one opening for air to flow thereout, and

16 the front housing in fluid tight relation with the front cover to force air to  
17 flow through the at least one opening in the front housing and out at least one opening  
18 in the front cover.

1 20. A method for cooling an electric motor having a stator with a  
2 plurality of laminations and motor windings, the method comprising the steps of:

3 forming a housing with a first surface and a second surface, and defining  
4 an interior space;

5 enclosing substantially all of the plurality of stator laminations within the  
6 interior space of the housing;

7 providing airflow i) into the first surface of the housing, ii) over  
8 substantially all of an exterior portion of the plurality of stator laminations, iii) over  
9 substantially all of the windings, and iv) out of the second surface of the housing.

1 21. An electric motor according to claim 20, wherein the motor is a  
2 permanent split capacitor motor.

1 22. An oscillating fan incorporating the method according to claim 21.

1 23. An oscillating fan comprising:

2 an electric motor including:

3 i) a first housing having:

4 (a) a first wall defining a first interior space, and

5 (b) a first plurality of openings disposed on a surface of  
6 the first housing;

7 ii) a second housing having:

8 (a) a second wall defining a second interior space, and

9 (b) a second plurality of openings disposed on a surface of the second  
10 housing; and

11                   iii) a stator having a plurality of laminations, a first portion of  
12                   windings and a second portion of windings, the plurality of  
13                   laminations disposed substantially within at least one of the first  
14                   interior space and the second interior space, and

15                   a motor cover substantially enclosing the first and second housings  
16                   therein, the motor cover including:

17                   i) a first cover coupled to the second housing, the first cover having a  
18                   third plurality of openings in a surface thereof, at least a portion of the  
19                   third plurality of openings adjacent and in fluid communication with at  
20                   least a portion of the second plurality of openings, and

21                   ii) a second cover coupled to the first cover and substantially  
22                   surrounding the first and second housings, the second cover having a  
23                   fourth plurality of openings in a surface thereof, at least a portion of  
24                   the fourth plurality of openings adjacent and in fluid communication  
25                   with at least a portion of the first plurality of openings,

26                   wherein air flows i) into at least a portion of the fourth plurality of  
27                   openings ii) through at least a portion of the first plurality of openings, iii) over the first  
28                   portion of windings, substantially all of an exterior portion of the stator laminations, and  
29                   the second portion of windings, iv) through at least a portion of the second plurality of  
30                   openings, and v) out at least a portion of the third plurality of openings.